



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Inventor: G. Cook et al.

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Title: Direct Bonding of Glass Articles  
for Drawing

Group Art Unit: 1731

Examiner: HOFFMANN, John M

**SUBMISSOIN**

Mail Stop Amendment  
Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

Sir:

**SUBMISSION**

In furtherance to the amendment filed on September 2, 2004 in response to the Office Action dated June 2, 2004, Applicants submit herewith a legible true copy of the following reference:

Arthur Landrock, "Surface Preparation of Adherends"; Adhesives Technology Handbook, 1985, page 117-118.

This is reference AK in the IDS filed by Applicants on February 2, 2004. The Examiner indicated the previous copy submitted by Applicant was in poor quality and thus could not be read. Applicants have obtained a legible copy of this reference after the submission of the amendment on September 2, 2004, a photocopy of which is submitted herewith.

The undersigned attorney is granted limited recognition by the Office of Discipline and Enrollment of the USPTO to practice before the USPTO in capacity as an employee of Corning Incorporated. A copy of the document granting such limited recognition either has been previously submitted or is submitted herewith for the record.

Please direct any questions or comments to the undersigned at (607) 248-1253.

Respectfully submitted,

Date: September 8, 2004

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Date of Deposit: Sept. 8, 2004  
I hereby certify that this paper (along with any paper referred to as being attached or enclosed) is being deposited with the United States Postal Service on the date indicated above with sufficient postage as first class mail in an envelope addressed to: Mail Stop Amendment, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.  
  
Siwen Chen

Wood surfaces are sometimes intentionally roughened by tooth planing, scratching, or *sanding* with coarse sandpaper, in the belief that rough surfaces provide better glued joints. However, comparative strength tests at the USDA Forest Products Laboratory failed to show such an advantage. Also, studies of the penetration of glue into the wood have shown the theoretical benefit of the roughened surfaces to be improbable. *Light sanding*, on the other hand, has been helpful in preparing for gluing such surfaces as resin-impregnated wood laminated paper/plastic, plywood that has been glazed from dull tools, or by being pressed excessively against smooth, hard surfaces.

Significant developments in sanding equipment have been reported in recent years. Advantages of so-called abrasive planing in preparing wood for gluing produce deeper cuts in a single pass, close tolerances and improved surface quality for gluing.<sup>93</sup>

## SURFACE PREPARATION OF MISCELLANEOUS MATERIALS

### Asbestos (Rigid)<sup>20</sup>

- (a) Abrade with 100-grit emery cloth
- (b) Remove dust
- (c) Degrease in acetone
- (d) Dry in air to allow solvent to evaporate

An alternative procedure is to prime with diluted adhesive or low-viscosity resin ester.

### Brick and Fired Non-Glazed Building Materials<sup>3</sup>

- (a) Degrease with methyl ethyl ketone
- (b) Abrade surface with a wire brush
- (c) Remove all dust and contaminants

### Carbon and Graphite (For General-Purpose Bonding)<sup>2</sup>

- (a) Abrade with 220-grit emery cloth
- (b) Remove dust
- (c) Solvent degrease in acetone

### Glass (Non-Optical)<sup>3,20</sup>

Abrasive treatment (for general-purpose bonding)—

- (a) Grit-blast with aluminum oxide or carborundum and water slurry (1 part by volume of 220 to 325-grit slurry of aluminum oxide or carborundum to 3 parts by volume of distilled water)
- (b) Degrease in acetone or detergent

- (c) Dry 30 minutes at 100°C (212°F). (The drying process improves the bond strength.)
- (d) Apply the adhesive before the glass cools to room temperature

Acid etch (for maximum strength)–

- (a) Clean in acetone or detergent
- (b) Immerse for 10-15 minutes at 20°C (68°F) in:

Sodium dichromate	7 pbw
Sulfuric acid, conc.	400 pbw
Water	7 pbw

- (c) Rinse in tap water
- (d) Rinse in distilled water
- (e) Dry thoroughly

Primers<sup>2</sup>–Adhesion to clean glass may be promoted by the use of silicone primers. The selection of primers depends on the particular adhesive system used. The addition of silane additives to the adhesive system also improves adhesion to glass.

#### Glass (Optical)<sup>6</sup>

Optical glass should never be subject to any acid or alkaline etching or leaching action.

- (a) Clean in ultrasonic equipment with a detergent solution, water, alcohol sequence
- (b) Air- or oven-dry at less than 40°C

If the optical glass is to be stored for any length of time, glass containers such as petri dishes should be cleaned and dried, using the above sequence. The optical glass can then be safely stored in the cleaned glass container.

#### Ceramics (Unglazed)<sup>2,20</sup>

For unglazed ceramics such as alumina, silica, etc.:

- (a) Grit-blast with aluminum oxide or carborundum and water slurry (1 part by volume of 220-325 grit slurry of aluminum oxide or carborundum to 3 parts by volume of distilled water)
- (b) Degrease in acetone or detergent

#### Ceramics (Glazed)<sup>20</sup>

For glazed ceramics such as porcelain:

- (a) Solvent degrease in acetone or wash in warm aqueous detergent

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